Josh Shachar

a Lifetime of Vision

Congratulations to all the
new members of the

CEDARS-SINAI®

Emeritus Medical Staff

It is truly an honor to be here amongst such an esteemed group. Many of you I know as friends and colleagues with whom I have worked side by side on various advanced technology development projects. My relationship with Cedars-Sinai stretches back many years and in that time I have come to trust and depend upon the values and passion Cedars has for advancing the art and science of healthcare, not for profit sake alone, but more importantly for the betterment and quality of life the organization brings to its patients, their families, the community it serves, and the world we all live in.

Surely Hypocrites had the physicians, nurses, administrators and support staff here at Cedars-Sinai in mind when he said, ""Wherever the art of Medicine is loved, there is also a love of Humanity."

I hope the time we have together today as I share my journey of discovery will not only be of interest, but will provide some insights into why we must continually strive to do our jobs better and why we must never be satisfied with where we have come but always be looking to where our journey can take us next.

Josh Shachar

a BRIEF HISTORY

Josh Shachar was born in Israel in 1956. He lived there with his family where he attended university and served in his country's armed forces before receiving a Fulbright Scholarship to UCLA and immigrating to the U.S.

After a near-fatal car crash, Josh re-evaluated the academic path he was on and decided to leave UCLA to begin his own journey of scientific discovery. This led to the creation and building of several advanced technology companies which he grew to both innovative and financial success.

Josh's first ground-breaking achievements were in the area of structural engineering, fuel system advancement and control system optimization across a wide spectrum of technology platforms for the U.S. Department of Defense. This on-going relationship, which has lasted for more than three decades, resulted in quantum breakthroughs in the areas of vehicle delivery efficiencies, radar imaging and advanced guidance systems.

Two of the companies he founded in this arena, Edel Engineering and Engineered Magnetecs, are still thriving today and continuing to set the standard for their respective industries.

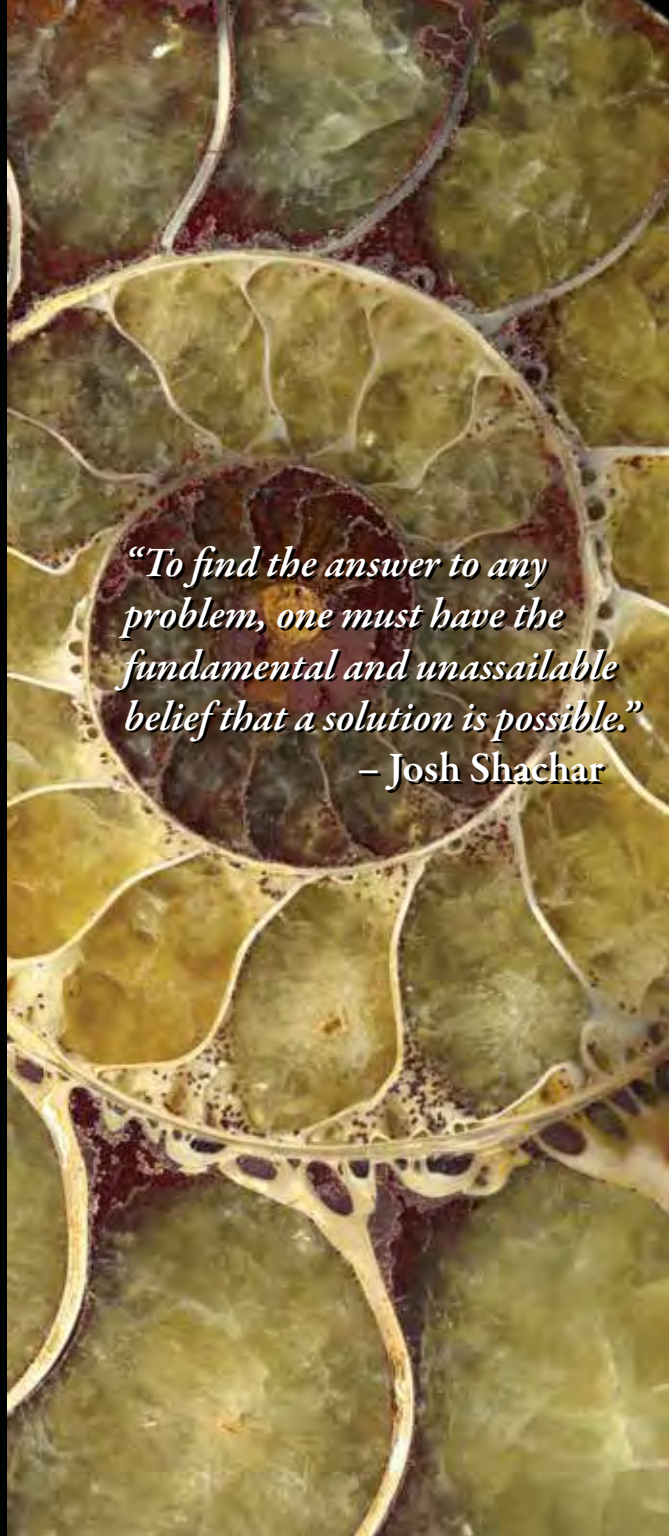
Josh's shift from military technology to advanced medical control and disease prevention systems was the result of two important moments in his life. The first occurred during a project he was conducting at Lawrence Livermore Labs. Josh became acquainted with Edward Teller, inventor of the Hydrogen Bomb and a key figure in the development of U.S. defense programs through most of the second half of the 20th century. During a discussion Teller told Josh and some other scientists that he saw the military's hold on its technology IP coming to an end and that they needed to look to new ways to convert their innovations to commercial applications. The second event occurred several years later when he witnessed his mother undergo a catheter stint procedure as a result of a severe heart attack she suffered. In watching the dance between the patient and the physician as he manually guided the catheter through her living body and into her beating heart, Josh knew that there had to be a more effective way to accomplish the task.

So in 2002, Josh, along with Dr. Eli Gang and some top medical and business partners founded Magnetecs Corporation in order to develop his vision for a better way to allow a physician to control the movement of

a catheter within a patient. The result is Magnetecs' Catheter Guidance Control and Imaging (CGCI) system. CGCI uses proprietary imaging and magnetic field lensing technologies developed by Josh and his team to accurately map the target area of a patient in a three-dimensional image in real time and then use that information to robotically guide a catheter directly to site in order to perform whatever procedure is required. Originally designed for the ablation of cardiac arrhythmias associated with AFib, CGCI, now in human study phase, has wide applications across a variety of disease treatment and is poised to forever change the way catheter-based procedures are managed.

With the success of Magnetecs, Josh has turned his attention to other key innovations including Smart Drug Delivery systems, programmable and remote controllable diagnostic devices, advanced surgical tool development and advanced Biosensor technologies that have broad-range applications for disease prevention and early-stage disease detection. In 2013 and 2014, Josh's biosensor technology was awarded "Innovation of the Year" and "Best Practices Award" by the global medical technology review firm of Frost and Sullivan.

Josh holds close to 100 patents as well as numerous published publications. He and his wife Dorit are the proud parents of three incredible children.



a LEGACY of EXCELLENCE

In the past 30 years, Josh Shachar has founded and led to success several advanced engineering and technology companies that have been leaders in pushing the horizons of achievement and innovation.

THERMOCONTROL INC. — Laser Temperature Sensing Systems

Pastushin Aviation, Inc. — Aerospace Fuel Containment Systems

LAMBDASignetecs, Inc. — Fuel Management Systems

TCA ThermoCouple America LLC — Jet Turbine Manufacturer

CARNAP ANALYTIC CORP. — Commercial Smart Device Development

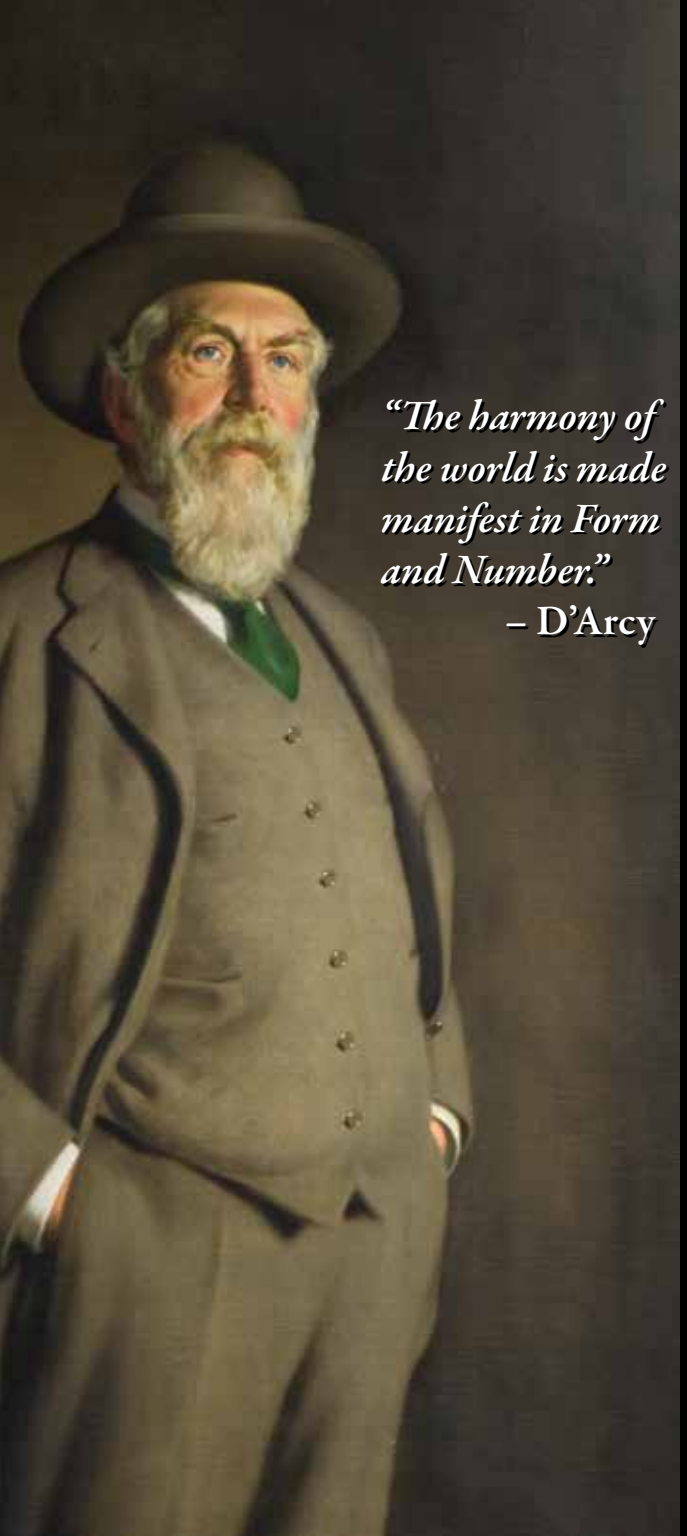
DOD General Utility Manufacturing

DOD Weapons Systems Manuf.

Smart Drug Delivery Systems

Advanced Biosensor Technology

Robotic Controlled Medical Device Systems



"The harmony of the world is made manifest in Form and Number."
– D'Arcy

A biographical note usually takes the form of a cooking recipe. It is a bit of this and that, which when read, really imparts nothing of the intended flavor to the aspiring chief. The true essence of the dish is impossible to convey and consequently the purpose for the information is lost. I have therefore elected to provide a deeper insight into the experiences I have been through and the people I have met that have helped me to form my world view. Together they have helped to shape the tools with which I work.

At the core of any task is the fundamental and unassailable belief that a solution is possible. For me, that solution is invariably one in which simplicity and form come together to create an answer which upon reflection becomes self-evident in its design and function.

Although many great minds have influenced my thought processes, it is D'Arcy Thompson's "On Growth and Form" that is the basis from which my world view on how to approach a solution to any engineering problem is founded.

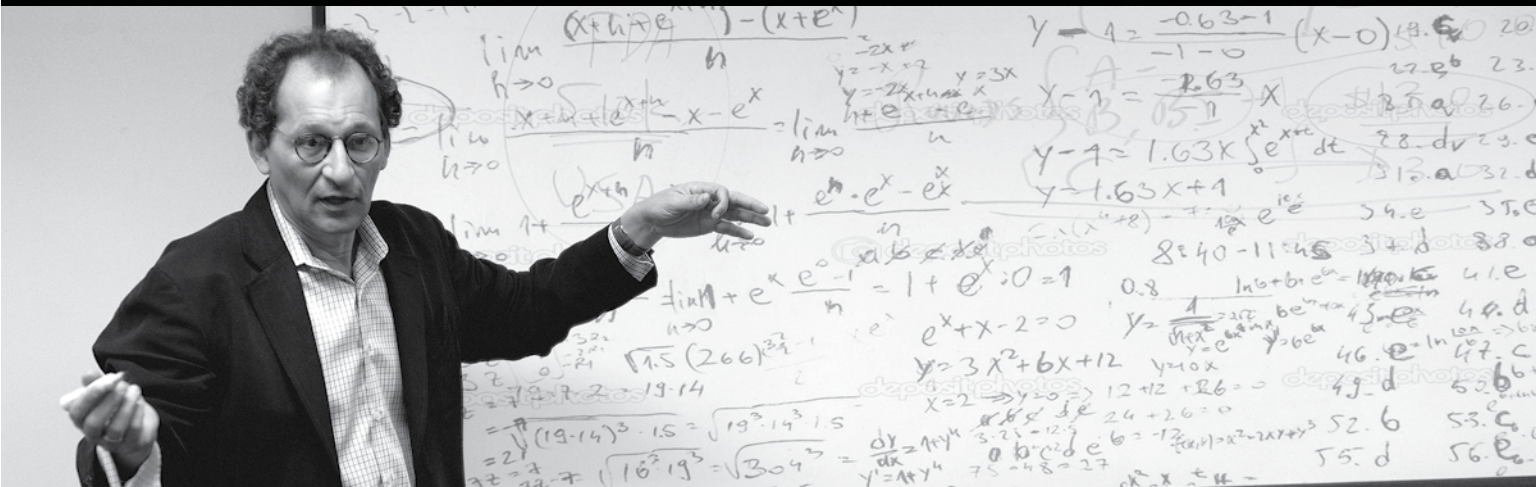
D'Arcy taught me the fundamental attitude that the observer needs to assume, and the proper state of mind when uncovering the behavior of a process and its physical attributes. Our duty as observers is to uncover the essential and historic connections that form the specific processes

which enable a system to not only function, but to thrive. In nature, no organic forms exists save such as are in conformity with physical and mathematical laws.

So when I look at an engineering problem, I search for the simplest and most logical solution that nature has so frequently shown to be correct. My approach to problem solving is anchored in this relentless search to identify the fundamental rules that govern the behavior of the system I am investigating and to then use those rules to form an axiom from which I can begin to find an answer. The interpretation of the specific subject matter, be it magnetic navigation, medicating apparatus, chemotherapeutic dispensing reservoirs, or biosensors with Aptamer base analogs, always leads me back to this realm of aesthetical considerations. Symmetry, as well as the uniformity within the dynamics of the subject matter, always lie at the heart of any search.

Of course, curiosity is also a prerequisite for the journey of any natural scientist. The never ending desire to seek new understanding of the deeper connections that lie at the heart of all processes, allowing us to see harmony and interdependence where before we just saw chaos and randomness. This is the fire that sparks the minds of all those who have pushed our understanding to new horizons and to new frontiers of exploration.

In all of this, I, like D'Arcy, am not trying to reduce the wonders and mystery of the living body to a mechanism or a mathematical formula. Rather, in understanding the fundamental principals by which a rose blooms or a bee flies, I can better appreciate the truth of "Deus ex machina" , God from the machine.



a VISION FOR TOMORROW

Below are some of the current technologies that Josh Shachar and his team are working on to advance the ability of the physician to heal with higher precision, greater efficacy and better patient outcome

(CGCI) Catheter Guidance Control and Imaging System

(MBP) Metronomic Biofeedback Pump

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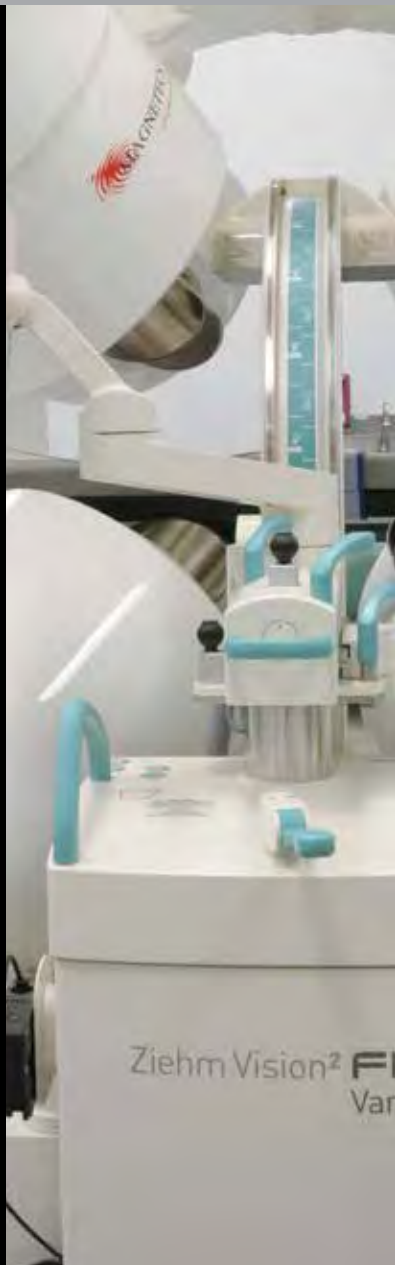

To learn more about these and other exciting developments on the horizon, please visit:

MAGNETECS.com and PHARMACOKINESIS.com

VEGF 165 Biosensor

(CMMD) Cancer Monitoring Diagnostic Device

(RBP) Rapid Pathogen Detection Device

To learn more visit JoshShachar.com
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